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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,821	12/27/2001	Jinn-Fa Wu	ASI 109	9861

7590 12/08/2003
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EXAMINER

COMPTON, ERIC B

ART UNIT	PAPER NUMBER
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3726

DATE MAILED: 12/08/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/026,821

Applicant(s)

WU ET AL.

Examiner

Eric B. Compton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 is/are allowed.
- 6) ☒ Claim(s) 6-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 6-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 6, lines 6-8, require “the outer and the first inner sleeve are secured together in a **room temperature** for compressing the first inner sleeve to extend axially by the outer sleeve.” (emphasis added). Room temperature suggests an ambient temperature. However, the specification on page 4, lines 17-26 discloses that the outer sleeve is secured to the inner sleeve by heating the outer sleeve to expand its inner diameter in order to slip it over the inner sleeve and then decreasing the temperature to cause contraction of the outer sleeve (i.e., a shrink fit process). See *a/so* claim 1, steps d-e. Therefore, the outer and inner sleeves are fit together at least at an elevated temperature (i.e., heated) rather than at a room temperature.

Thus, “in a room temperature” should read –at an elevated temperature and cooled--

Claims 7-9 depend from claim 6, and therefore are also nonenabling.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. 4,717,977 to Brown.

Regarding claim 6, Brown discloses an apparatus for automatically dynamically adjusting prestressed bearings (col. 5, lines 32-38 discussing preloading bearings) of a shaft (44) comprising:

A sleeve assembly (34, 48) sandwiched between the bearings (66, 68) and including an outer sleeve (48) and a first inner sleeve (34) fitted together wherein a first thermal expansion coefficient of the outer sleeve is larger than that of the first inner sleeve (col. 2, lines 64-69, discussing differences of thermal expansion of the members 34, 48), an inner diameter of the outer sleeve is smaller than an outer diameter of the first inner sleeve (col. 4, line 59-60, discussing interference fit between the members 34, 48), and the outer and the first inner sleeves are secured together at an elevated temperature and cooled for compressing the first inner sleeve to extend axially by the outer sleeve (col. 4, lines 55-68, discussing a thermal heat shrink fit).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown in view of U.S. Pat. 3,561,829 to Heldt.

Brown discloses the invention cited above. Specifically, that the inner sleeve is steel and the outer member is aluminum. It is noted that the coefficient of thermal expansion of aluminum is greater than that of steel. Col. 1, lines 49-54.

However, Brown does not disclose the particular materials claimed, i.e., that the outer sleeve is brass and the inner sleeve in Invar alloy.

Heldt discloses a sleeve assembly (12-14) mounted onto a shaft and bearings are then sandwiched between the bearings (6) as shown in Figure 4. The sleeve assembly relies on a wedge system to compensate for thermal expansion, wherein the outer wedges (10, 12, 13) have a greater coefficient of thermal expansion than the inner wedge member (9, 14). See col. 2, lines 34-39. The outer sleeve may be brass and the inner sleeve may be Invar alloy. Col. 2, lines 27-31.

Regarding claims 8-9, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the bearing apparatus of Brown, wherein the outer member is brass and the inner member is Invar alloy, in light of the teachings of Heldt, so that "the bearing will be adjusted in a manner that a

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detrimental pressure in the bearing is avoided." See Col. 2, lines 42-43; See also *In re Leshin*, 125 USPQ 416 (CCPA 1960) (holding that it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice).

Allowable Subject Matter

7. Claims 1-5 are allowed.

8. Although rejected above, Claim 7 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and by overcoming the 112 rejections above.

9. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 1-5, the prior art of record does not teach or suggest a method of prestressing bearings of shaft comprising: providing an outer and inner sleeve; wherein the outer sleeve has a coefficient of thermal expansion greater than the inner sleeve and an inner diameter smaller than the outer diameter of the inner sleeve; shrink-fitting the outer sleeve over the inner sleeve; and mounting the sleeve assembly onto a shaft prior to sandwiching the sleeve assembly between the bearings, in combination with the other claimed subject matter.

Regarding claim 7, the prior art of record does not teach or suggest an apparatus having an outer and first and second sleeves, connect by a shrink fit and having

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decreasing coefficients of thermal expansion, in combination with the other claimed subject matter.

In U.S. Pat. 4,717,977 to Brown, although the sleeve assembly (34, 48) is shrink fitted together like Applicant's sleeve assembly, it is not mounted onto the shaft prior to sandwiching the sleeve assembly between the bearings. In contrast, the bearings are first mounted to the sleeve assembly and the shaft is then pressed onto the bearing; thus the sleeve assembly is not mounted onto the shaft. There is no suggestion to mount the sleeve assembly on the shaft, due to the presence on the stator coil.

In U.S. Pat. 3,561,829 to Heldt, a sleeve assembly (12-14) is mounted onto a shaft and bearings are then sandwiched between the bearing as shown in Figure 4. The sleeve assembly relies on a wedge system to compensate for thermal expansion, wherein the outer wedges (12, 13) have a greater coefficient of thermal expansion than the inner wedge member (14). See col. 2, lines 34-39. However, Heldt does not teach or suggest that an outer sleeve member, having an inner diameter smaller than the outer diameter of an inner sleeve member, is shrink fitted over the inner member.

In U.S. Pat. 6,599,022 to Obara, a sleeve (4) is press-fit over the outer bearing race (2). In contrast to Applicant's invention, the sleeve has a coefficient of thermal expansion less than the race.

In U.S. Pat 6,398,418 to Chang et al, the outer sleeve and inner sleeve are not in contact.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (703) 305-0240. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory M. Vidovich can be reached on (703) 308-1513. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.



Eric Compton
Patent Examiner
A/U 3726

October 9, 2003